National Institute of Environmental Health Sciences

Climate change is likely to worsen the public health threat of diarrheal disease in Botswana

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Abstract:

Diarrheal disease is an important health challenge, accounting for the majority of childhood deaths globally. Climate change is expected to increase the global burden of diarrheal disease but little is known regarding climate drivers, particularly in Africa. Using health data from Botswana spanning a 30-year period (1974-2003), we evaluated monthly reports of diarrheal disease among patients presenting to Botswana health facilities and compared this to climatic variables. Diarrheal case incidence presents with a bimodal cyclical pattern with peaks in March (ANOVA $p < 0.001$) and October (ANOVA $p < 0.001$) in the wet and dry season, respectively. There is a strong positive autocorrelation ($p < 0.001$) in the number of reported diarrhea cases at the one-month lag level. Climatic variables (rainfall, minimum temperature, and vapor pressure) predicted seasonal diarrheal with a one-month lag in variables ($p < 0.001$). Diarrheal case incidence was highest in the dry season after accounting for other variables, exhibiting on average a 20% increase over the yearly mean ($p < 0.001$). Our analysis suggests that forecasted climate change increases in temperature and decreases in precipitation may increase dry season diarrheal disease incidence with hot, dry conditions starting earlier and lasting longer. Diarrheal disease incidence in the wet season is likely to decline. Our results identify significant health-climate interactions, highlighting the need for an escalated public health focus on controlling diarrheal disease in Botswana. Study findings have application to other arid countries in Africa where diarrheal disease is a persistent public health problem.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3709313

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Temperature

Extreme Weather Event: Drought

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Other Geographical Feature

Other Geographical Feature : Subtropical

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Botswana

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Fly-borne Disease

Fly-borne Disease: General Fly-borne Disease

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Medium-Term (10-50 years)

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content